



Certificate of Express Mail No. EL 977933768 US
Attorney Docket No.: 17938 (AT 20958-2091)

PATENT
Serial No.: 10/624,856

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: McAlonis, et al.

:
: Art Unit: 2833

Serial No.: 10/624,856

:
: Examiner: Vu, Hien D.

Filed: July 22, 2003

For: CONTACT HAVING MULTIPLE
CONTACT BEAMS

DECLARATION UNDER 37 CFR 1.132

Mail Stop: Amendment
P.O. Box 1450
Commissioner for Patents
Alexandria, VA 22313-1450

I, Dean Small, declare and state as follows:

1. I have reviewed and understand the specification and drawings of U.S. Application 10/624,856 (hereafter "Subject Application").
2. I have reviewed and understand the claims of the Subject Application (hereafter "Claimed Invention").
3. I am currently a registered patent attorney and have represented Tyco Electronics as outside patent counsel since at least 2001.

FACTS AND DOCUMENTARY EVIDENCE

4. Factual evidence proving the statements made in this Declaration can be found hereafter and in the attached documents (Appendices A-E).
5. Appendix A attached hereto sets for a preliminary invention disclosure prepared by the inventors of the Subject Application and assigned number 2002095 (hereafter "PID 2002095"). The PID 2002095 describes the Claimed Invention in detail, and includes numerous computer generated drawings illustrating various contact configurations that represent embodiments of the Claimed Invention.
6. On information and belief, the drawings at appendix A were prepared by the inventors on or about April 29 and 30, 2002, which are the dates printed on the drawings. On information and belief, the text of the PID 2002095 at appendix A was prepared by one or more of the inventors on or about April 30, 2002, the date on the cover page of the PID 2002095. The PID 2002095 is signed and dated by each inventor on different days in May of 2002.

7. On information and belief, the PID 2002095 was submitted by the inventors to the responsible in-house patent counsel, Robert J. Kapalka, who was employed by The Whitaker Corporation, an entity wholly-owned by Tyco Electronics.
8. On information and belief, Mr. Kapalka reviewed the PID 2002095 and determined that a patent application should be prepared in connection with the PID 2002095.
9. On or about September 20, 2002, Mr. Kapalka sent me the PID 2002095, along with a cover letter dated September 20, 2002 which is attached at Appendix B, requesting that I prepare a patent application related to the inventions described in the PID 2002095.
10. In accordance with the request of Mr. Kapalka, during the weeks following September 20, 2002, I undertook to contact the first named inventor, Matthew McAlonis, and to work with the inventors to prepare a first draft of a patent application.
11. On or about January 28, 2003, I provided to Mr. McAlonis an electronic copy of a first draft of a patent application related to the PID 2002095, and requested that he and his co-inventors review the application. A copy of my cover letter dated January 28, 2003 to Mr. McAlonis is attached at appendix C.
12. Over the next several weeks following January 28, 2003, I received feedback from Mr. McAlonis and his co-inventors regarding the patent application.
13. On or about March 11, 2003, I provided to Mr. McAlonis an electronic copy of a final draft patent application related to the PID 2002095. A copy of my cover letter dated March 11, 2003 to Mr. McAlonis is attached at appendix D.
14. Over the next several weeks following March 11, 2003, Mr. McAlonis and his co-inventors reviewed the final application and the claims to, among other things, determine the correct inventors that should be named on the patent application. Following this determination, I was provided with a final listing of the correct inventors to be named on the patent application.
15. On or about May 20, 2003, I revised the declaration and power of attorney, and assignment documents to correct the inventors names and I provided the corrected documents to a co-inventor, Troy Conner, who had responsibility for obtaining the executed documents. A copy of an e-mail communication dated May 20, 2003 from my assistant (sent on my behalf) to Mr. Connor is attached at appendix E.
16. On or about July 23, 2003, I filed the Subject Application with the US Patent and Trademark office.
17. Based upon the foregoing facts, on information and belief, the claimed invention was conceived by the inventors of the Subject Application before May 21, 2003, the US filing date of US Patent 6,688,893 to Huang, and before November 13, 2002 (the foreign priority date of the '893 patent).

18. The inventors, Mr. Kapalka and I were diligent, from conception of the Claimed Invention, up through constructive reduction to practice of the Claimed Invention, by filing the Subject Application on July 23, 2003 with the US Patent and Trademark Office.

DECLARATION

As the person signing below:

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application and any patent issued thereon.

SIGNATURE

SOLE INVENTOR

Full Name: Dean D. Small

Signature: Dean Small Date: 1/12/05

Residence: One Mosley Acres ST. Louis, MO 63141

Citizenship: US

Post Office Address: N/A

The following are attached and made a part hereof:

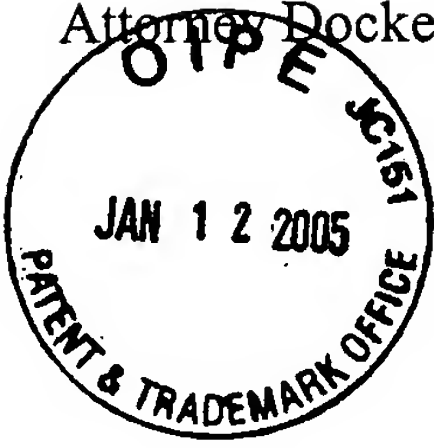
Attachment A: Preliminary Invention Disclosure dated April 30, 2002, with attached drawings of various embodiments of the Claimed Invention dated April 29, 2002 and April 30, 2002.

Attachment B September 20, 2002 letter from Robert J. Kapalka to Dean Small, requesting preparation of a patent application.

Attachment C: January 28, 2003 letter from Dean Small to Matthew McAlonis, first named inventor, forwarding first draft patent application to inventors for review.

Attachment D: March 11, 2003 letter from Dean Small to Matthew McAlonis, forwarding final draft application for review.

Attachment E: May 20, 2003 email communication from Dean Small's assistant (on behalf of Dean Small) to Troy Connor, co-inventor, forwarding corrected declaration and assignment paperwork to inventors for execution.



APPENDIX A



Attorney Docket No.: 17938 (AT 20958-2091)

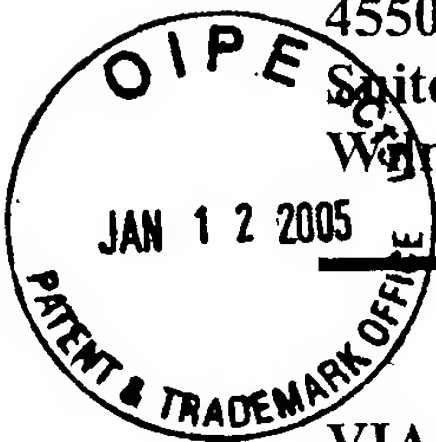
Serial No.: 10/624,856

APPENDIX B

THE WHITAKER CORPORATION

4550 New Linden Hill Road
Suite 450
Wilmington, DE 19808-2952

Robert J. Kapalka
Phone: (302) 633-2771
Fax: (302) 633-2776



VIA FIRST CLASS MAIL

September 20, 2002

Dean Small, Esq.
McAndrews, Held & Malloy, Ltd.
34th Floor
500 West Madison Street
Chicago, IL 60661

Re: New Patent Application Case Nos. 17936, 17937 and 17938

Dear Dean:

Enclosed are copies of three PID's which relate to Tyco's Z-axis VRM (Voltage Regulator Module) project.

Please prepare patent applications for these PID's, and associate our case numbers with the PID's as follows:

<u>PID</u>	<u>Case No.</u>
2002093	17936
2002094	17937
2002095	17938

Please contact the inventors for complete details about the inventions.

I note that each of these PID's names ten inventors, and I suspect that these are people who are associated with the project, but who are not necessarily true inventors. Please try to determine correct inventorship as you investigate these cases.

Please acknowledge receipt of this letter via e-mail to rjkapalka@tycoelectronics.com.

Sincerely,

A handwritten signature in cursive script that reads "Bob Kapalka". The signature is written in dark ink and is positioned above the printed name.

Robert J. Kapalka
Patent Attorney

RJK/pmc
Enclosure(s)



APPENDIX C



ARMSTRONG TEASDALE LLP

Dean D. Small
(314) 259-4711
dsmall@armstrongteasdale.com

MISSOURI | KANSAS | ILLINOIS | WASHINGTON, DC | SHANGHAI | SYDNEY

ATTORNEYS AT LAW

January 28, 2003

VIA ELECTRONIC MAIL

Matthew McAlonis
mmcaloni@tycoelectronics.com

Your File No. 17938
Our File No. 20958-2091

Re: U.S. Patent Application
Title: "Contact Having Multiple Contact Beams"

Dear Matt:

At the instruction of our client, Tyco Electronics Corporation (The Whitaker Corporation), we have prepared the enclosed draft patent application, including a set of claims, an abstract, a specification, and informal drawings. Please review these materials carefully, both to supplement areas where more description is needed and to correct any errors. If you are not the sole inventor, please distribute copies of the enclosed materials to your co-inventors and ask that they review the material in the same manner as outlined above. Then return a copy of the application containing your comments so that we may make the necessary changes. Once we have made any necessary corrections and additions to the application, we will send you the application in final form with the necessary paperwork for execution and filing. With respect to the informal drawings, please forward clean Auto CAD files for use in preparation of formal drawings.

As we understand it, all of the rights to the invention described in this patent application shall be assigned (i.e. ownership of all rights in the invention will be transferred) to Tyco Electronics Corporation, 2901 Fulling Mill Road, Middletown, PA 17057.

If you plan to disclose the invention for the first time soon, please advise us of your plans well in advance. If possible, we will complete and file this application before the invention is first disclosed, to preserve your right to file foreign counterpart applications in the future.

Finally, a duty of disclosure rests upon each inventor, each attorney, and every other individual who is substantively involved in the preparation and prosecution of a patent application. Each of these individuals has a duty to disclose all material information of which he or she is aware to the Patent and Trademark Office in a timely manner, failing which any resulting patent might be found invalid.



Generally speaking, "material information" is any information which establishes, alone or in combination with other information, a "prima facie" case that the claimed invention is not patentable, or which refutes or is inconsistent with an argument the applicant makes to the PTO respecting patentability. Such "material information" may include:

- 1) disclosures in prior U. S. or foreign patents, patent applications, or publications;
- 2) information known or used by others in this country;
- 3) the details of articles or processes which have been publicly or commercially used, offered for sale or sold in this country by you or others; and
- 4) the prior inventions of other inventors.

Please provide any such information you have which is not already discussed in the enclosed patent application.

If you have any questions, do not hesitate to call.

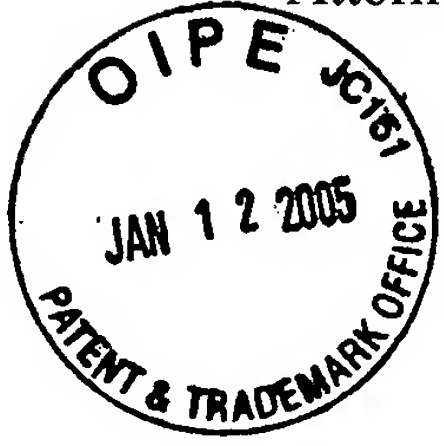
Very truly yours,

Dean D. Small

Dean D. Small

DDS/lr
Enclosures

cc: Bob Kapalka



APPENDIX D

Dean D. Small
(314) 259-4711
dsmall@armstrongteasdale.com


ARMSTRONG TEASDALE LLP

MISSOURI

KANSAS

ILLINOIS

WASHINGTON, DC

SHANGHAI

SYDNEY

ATTORNEYS AT LAW

March 11, 2003

VIA ELECTRONIC MAIL

Matthew R. McAlonis
mmcaloni@tycoelectronics.com

Tyco Docket No. 17938
Our Docket No. 20958-2091

Re: U.S. Non-Provisional Patent Application
Titled: "CONTACT HAVING MULTIPLE CONTACT BEAMS"

Dear Matthew:

We enclose a final draft patent application concerning the above-identified invention which we have prepared on behalf of our client Tyco Electronics Corporation (The Whitaker Corporation). Please have each inventor review the application carefully for accuracy and completeness. Also enclosed are the Declaration and Power of Attorney, and the Assignment documents. Please review the spelling of your names and address in the attached documents and, if necessary, correct the electronic files before execution. If you are satisfied with the revised application, and have no other changes to the application, please have each inventor sign and date the Declaration and Power of Attorney and sign, date and have witnessed the Assignment. The witness should preferably be a co-worker. If you have not yet done so, please forward clean Auto CAD files for use in preparation of formal drawings.

As previously explained to you, a duty of disclosure rests upon each inventor, each attorney, and every other individual who is substantively involved in the preparation and prosecution of a patent application. Each of these individuals has a duty to disclose all material information of which he or she is aware to the Patent and Trademark Office in a timely manner, failing which any resulting patent might be found invalid. Please keep this duty in mind throughout prosecution of the present application.

If you have any questions, do not hesitate to call.

Very truly yours,

Dean D. Small

Dean D. Small

Enclosures

cc: Bob Kapalka (via electronic mail)



APPENDIX E

Rebecca Scoggin

From: Rebecca Scoggin on behalf of Dean Small
Sent: Tuesday, May 20, 2003 1:52 PM
To: 'teconner@tycoelectronics.com'
Cc: Dean Small
Subject: Tyco Docket #17938 (AT Docket #20958-2091)

Troy: Attached find corrected Declaration and Assignment documents. If you have any questions, please feel free to call.
Thanks so much, Becki

Rebecca A. Scoggin

Assistant to Dean Small

Armstrong Teasdale LLP

One Metropolitan Square, Suite 2600

St. Louis, MO 63102

(314) 621-5070

(314) 621-5065 FAX



Assignment
(S0978310).DOC



Declaration
(S0978309).DOC

CONFIDENTIALITY NOTICE:

This Material is intended for the named recipient and, unless otherwise expressly indicated, is confidential and privileged information. Any dissemination, distribution or copying of this material is prohibited. If you received this message in error, please notify the sender by replying to this message and then delete it from your system. Your cooperation is appreciated.

PRELIMINARY INVENTION DISCLOSURE

COMPLETE AND RETURN TO:

The Whitaker Corporation (M/S 324-01)
4550 New Linden Hill Road, Suite 450
Wilmington, DE 19808

SCRIPTIVE TITLE OF INVENTION:

Multiple Termination and Beam Contact for Surface Mount Connectors

DATE

4/30/02

WHAT IS THE PROBLEM WITH THE STATE OF THE ART, OR PRIOR ART TECHNOLOGY? WHAT IS THE PURPOSE OF THE INVENTION

In the world of electronics, manufacturers are consistently searching for methods to develop faster, more responsive, more reliable and lower cost systems. Size of components, inductance, and resistance are three features impact these system characteristics.

The quest to reduce size is driven by the goals for faster, more responsive, and lower cost systems. A reduction in components' size allows manufactures to utilize smaller printed wiring boards, and enclosures which reduces cost. The smaller sizes also create shorter circuit path which aids response time.

In addition to size, the response of many systems, especially power systems, are limited in their ability to respond to voltage transients due to high inductance. Lower inductance allows a quicker system response.

Lastly, resistance is a key fracture in system reliability. Lower resistance results in less heat generation and reduces energy consumption. This places a lighter thermal load on the system and allows equipment to operate more efficiently.

This design results in a smaller more dense connector system, with features which result in low inductance and low and more stable contact resistance value, all of which contribute to a more responsive, lower cost, and more reliable system.

WHAT ARE THE NEW FEATURES OF THE INVENTION WHICH OVERCOME THIS PROBLEM?

1. Overlapping Beams:

- Allow a greater quantity of power or signal to be transmitted through the same amount of area.
- Allow area for longer contact beams which facilitate a greater working range for the contact and at the same time permits using thicker stock material resulting a more robust contact.
- Place contact beams with opposite current flow in close proximity which lowers inductance by approximately 50%.

2. Multiple BGA or traditional surface mount terminations per contact:

- Prior Art surface mount designs feature only one termination per contact. This designs features from two to six leads per contact which lowers the overall contact resistance.

Working range: The range of z-axis separation in which the connector will still function. See diagram below.

ON SEPARATE DRAWINGS OR SKETCHES, DESCRIBE THE FEATURES OF THE INVENTION AND HOW THEY WILL WORK. ARE THESE ENCLOSED? ☒ YES ☐ NO

IDENTIFY THE CLOSEST PRIOR ART TECHNOLOGY, IF ANY, OF WHICH YOU ARE AWARE. PROVIDE COPIES IF AVAILABLE.

Socket-T contact is attached.

ENTER THE DATE OF THE FIRST WRITTEN DESCRIPTION OR THE FIRST DATED SKETCH OF INVENTION AND ATTACH COPIES. 2/22/02

ENTER THE DATE A WORKING MODEL, DEVICE OR PROCESS WAS OR WILL BE COMPLETED. 3/05/02

GIVE A BRIEF DESCRIPTION OF CIRCUMSTANCES OF INITIAL DISCLOSURE OUTSIDE AMP COMPANIES

Design was disclosed to Intel corporation on 2/22/02 under a confidentiality agreement and was labeled confidential.

ARE LATEST DRAWINGS ENCLOSED? ☒ YES ☐ NO ARE THEY CAD? ☒ YES ☐ NO

IF CAD, WHO SHOULD BE CONTACTED TO RETRIEVE CAD FILES? John Brown

INVENTOR'S FULL NAME (include full middle name) John Bossert Brown	INVENTOR'S FULL NAME (include full middle name) Matthew Richard McAlonis	INVENTOR'S FULL NAME (include full middle name) Justin Shane McClellan
BUSINESS PHONE 717-986-7304	BUSINESS PHONE 717-592-3478	BUSINESS PHONE 717-986-5953
FAX 717-986-3410	FAX 717-986-3410	FAX 717-592-3410
AMP EMPLOYEE NO. 51881	AMP EMPLOYEE NO. 38584	AMP EMPLOYEE NO. 50061
DIVISION C,C,&CE	DIVISION C,C,&CE	DIVISION C,C,&CE
MAILSTOP 128-83	MAILSTOP 128-83	MAILSTOP 128-83
CITIZENSHIP USA	CITIZENSHIP USA	CITIZENSHIP USA

2002095

HOME ADDRESS 1036 North US Route 15 Dillsburg, PA 17019	HOME ADDRESS 534A Beverly Road Elizabethtown, PA 17022	HOME ADDRESS 85 West Lauer Lane Camp Hill, PA 17011
SIGNATURE <i>J. B. Brown</i>	SIGNATURE <i>Matthew L. Muller</i>	SIGNATURE <i>Just S. McAllister</i>
DATE 07 May 2002	DATE 07 May 02	DATE 09 MAY 02
WITNESS <i>Attalee S. Taylor</i>	WITNESS <i>Just S. McAllister</i>	WITNESS <i>J. B. Brown</i>
WITNESS <i>Just S. McAllister</i>	WITNESS <i>J. B. Brown</i>	WITNESS <i>Matthew L. Muller</i>
DIVISION MGR NAME & PHONE Dave Martin 717-592-3110 Attalee Taylor 717-592-3252	DIVISION MGR NAME & PHONE	DIVISION MGR NAME & PHONE
— FOR THE WHITAKER CORPORATION USE ONLY —		
		PID NO. 2002095
		ATTORNEY Robert J. Kapalka PHONE: (302) 633-2771

J:\FORMS\PID.DOC

PRELIMINARY INVENTION DISCLOSURE

COMPLETE AND RETURN TO:

The Whitaker Corporation (M/S 324-01)
4550 New Linden Hill Road, Suite 450
Wilmington, DE 19808

DESCRIPTIVE TITLE OF INVENTION

Multiple Termination and Beam Contact

DATE

WHAT IS THE PROBLEM WITH THE STATE OF THE ART, OR PRIOR ART TECHNOLOGY? WHAT IS THE PURPOSE OF THE INVENTION?

WHAT ARE THE NEW FEATURES OF THE INVENTION WHICH OVERCOME THIS PROBLEM?

ON SEPARATE DRAWINGS OR SKETCHES, DESCRIBE THE FEATURES OF THE INVENTION AND HOW THEY WILL WORK. ARE THESE ENCLOSED? ☐ YES ☐ NO

IDENTIFY THE CLOSEST PRIOR ART TECHNOLOGY, IF ANY, OF WHICH YOU ARE AWARE. PROVIDE COPIES IF AVAILABLE.

ENTER THE DATE OF THE FIRST WRITTEN DESCRIPTION OR THE FIRST DATED SKETCH OF INVENTION AND ATTACH COPIES.

ENTER THE DATE A WORKING MODEL, DEVICE OR PROCESS WAS OR WILL BE COMPLETED.

GIVE A BRIEF DESCRIPTION OF CIRCUMSTANCES OF INITIAL DISCLOSURE OUTSIDE AMP COMPANIES

ARE LATEST DRAWINGS ENCLOSED? ☐ YES ☐ NO ARE THEY CAD? ☐ YES ☐ NO

IF CAD, WHO SHOULD BE CONTACTED TO RETRIEVE CAD FILES?

INVENTOR'S FULL NAME (include full middle name)
James Charles ShifflerINVENTOR'S FULL NAME (include full middle name)
David Charles MartinINVENTOR'S FULL NAME (include full middle name)
Michael Anthony CorrellBUSINESS PHONE
717-592-5216BUSINESS PHONE
717-592-3110BUSINESS PHONE
717-592-5156X
17-986-3446FAX
717-592-3244FAX
717-592-6735AMP EMPLOYEE NO.
20602AMP EMPLOYEE NO.
16684AMP EMPLOYEE NO.
44146DIVISION
C,C,&CEDIVISION
C,C,&CEDIVISION
C,C,&CEMAILSTOP
128-52MAILSTOP
128-52MAILSTOP
128-52CITIZENSHIP
USACITIZENSHIP
USACITIZENSHIP
USAHOME ADDRESS
115 Peach Ave.
Hershey, PA 17033HOME ADDRESS
1014 Tiverton Road
Mechanicsburg, PA 17050HOME ADDRESS
113 Providence Circle
Middletown, PA 17057

SIGNATURE

James C. Shiffler

SIGNATURE

David C. Martin

SIGNATURE

Michael A. Correll

DATE

14 MAY 2002

DATE

5/16/02

DATE

15 MAY 2002

WITNESS

14 May 2002

WITNESS

14 May 2002

WITNESS

14 May 2002

WITNESS

Matthew A. Sullivan

WITNESS

Matthew A. Sullivan

WITNESS

Matthew A. Sullivan

DIVISION MGR NAME & PHONE

DIVISION MGR NAME & PHONE

DIVISION MGR NAME & PHONE

— FOR THE WHITAKER CORPORATION USE ONLY —

PID NO.

2002095

ATTORNEY

Robert S. Kapalka

PHONE: (302) 633-2771

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INVENTOR'S FULL NAME (include full middle name) Peter Paul Wilson	INVENTOR'S FULL NAME (include full middle name) Attalee S. Taylor	INVENTOR'S FULL NAME (include full middle name) Brett Charles Miller
BUSINESS PHONE 717-592-5162	BUSINESS PHONE 717-592-3252	BUSINESS PHONE 717-986-7819
X 717-592-4699	FAX 717-985-2833	FAX 717-592-6735
AMP EMPLOYEE NO. 37829	AMP EMPLOYEE NO. 08751	AMP EMPLOYEE NO. 28485
DIVISION C,C,&CE	DIVISION C,C,&CE	DIVISION C,C,&CE
MAILSTOP 128-52	MAILSTOP 128-89	MAILSTOP 128-40
CITIZENSHIP USA	CITIZENSHIP USA	CITIZENSHIP USA
HOME ADDRESS 507 West Elm St. Palmyra, PA 17078	HOME ADDRESS 224 Bunny Lane Palmyra, PA 17078	HOME ADDRESS 65 Red Run Church Road East Berlin, PA 17316
SIGNATURE <i>Peter Paul Wilson</i>	SIGNATURE <i>Attalee S. Taylor</i>	SIGNATURE <i>Brett C. Miller</i>
DATE 5/13/02	DATE 5/13/02	DATE 5/13/02
WITNESS <i>Brett C. Miller</i> 5/13/02	WITNESS <i>Just S. McElh...</i>	WITNESS <i>Just S. McElh...</i>
WITNESS <i>Just S. McElh...</i>	WITNESS <i>H. B. Brown</i>	WITNESS <i>H. B. Brown</i>
DIVISION MGR NAME & PHONE	DIVISION MGR NAME & PHONE	DIVISION MGR NAME & PHONE

— FOR THE WHITAKER CORPORATION USE ONLY —

PID NO.

2002095

ATTORNEY

Robert S. Kapalka
PHONE: (302) 633-2771

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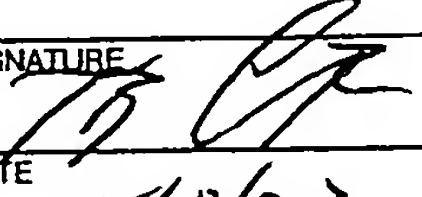
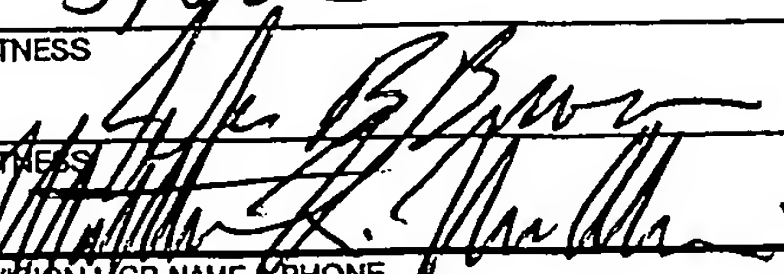
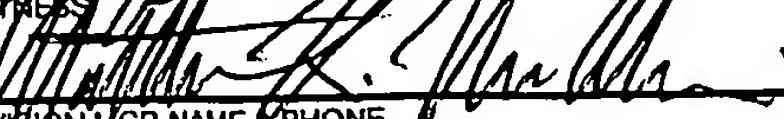
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ARE LATEST DRAWINGS ENCLOSED? ☐ YES ☐ NO ARE THEY CAD? ☐ YES ☐ NO

IF CAD, WHO SHOULD BE CONTACTED TO RETRIEVE CAD FILES?

INVENTOR'S FULL NAME (include full middle name) Troy Everette Conner	INVENTOR'S FULL NAME (include full middle name) B	INVENTOR'S FULL NAME (include full middle name) B
BUSINESS PHONE 717-986-5719	BUSINESS PHONE	BUSINESS PHONE
FAX 17-986-3410	FAX	FAX
AMP EMPLOYEE NO. 22604	AMP EMPLOYEE NO.	AMP EMPLOYEE NO.
DIVISION C,C,&CE	DIVISION	DIVISION
MAILSTOP 128-83	MAILSTOP	MAILSTOP
CITIZENSHIP USA	CITIZENSHIP	CITIZENSHIP
HOME ADDRESS 2851 Judith Ct York, PA 17404	HOME ADDRESS	HOME ADDRESS
SIGNATURE 	SIGNATURE	SIGNATURE
DATE 5/8/02	DATE	DATE
WITNESS 	WITNESS	WITNESS
WITNESS 	WITNESS	WITNESS
DIVISION MGR NAME & PHONE	DIVISION MGR NAME & PHONE	DIVISION MGR NAME & PHONE

— FOR THE WHITAKER CORPORATION USE ONLY —

PID NO.

ATTORNEY

PHONE: (302)